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**- REMARKS -**

In the Non-Final Office Action, Examiner Piziali rejected pending claims 1-16 on various grounds. The Applicant responds to each rejection as subsequently recited herein, and respectfully requests reconsideration and further examination of the present application under 37 CFR § 1.114:

A. Examiner Piziali rejected pending claims 1-7 and 9-15 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,677,705 to *Shimura et al.*

The Applicant has thoroughly considered Examiner Piziali's remarks concerning the patentability of claims 1-7 and 9-15 over *Shimura*. The Applicant has also thoroughly read *Shimura*. To warrant this anticipation rejection of claims 1-7 and 9-15, *Shimura* must show each and every limitation of independent claims 1 and 9 in as complete detail as is contained in independent claims 1 and 9. See, MPEP §2131. The Applicant respectfully traverse this anticipation rejection of independent claims 1 and 9, because *Shimura* fails to disclose and teaches away from "wherein the mutually orthogonal signals are obtained from at least two types of orthogonal functions having four elementary units of time; within which four elementary units of time one pulse each time has a first polarity which opposes a second polarity of the other pulses" as currently recited on record in independent claim 1, and "wherein, for each elementary unit of time, one pulse has a first polarity that opposes a second polarity of the other pulses" as currently recited on record in independent claim 9.

Specifically, *Shimura* teaches a function  $f(i,t)$  is expressed by an equation  $f(i,t) = F_r * \delta(i,t)$ , where  $\delta(i,t)=1$  when  $i=t$ , and where  $\delta(i,t)=0$  when  $i \neq t$ . See, Shimura at column 1, lines 56-66. An implementation of the aforementioned equation is illustrated in FIG. 3 of *Shimura*, and represented in the following TABLE 1:

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TABLE 1

	$t=1$	$t=2$	$t=3$	$t=i$	$t=N$
$f(1)$	$+F_p$	0	0	0	0
$f(2)$	0	$+F_p$	0	0	0
$f(3)$	0	0	$+F_p$	0	0
$f(i)$	0	0	0	$+F_p$	0
$f(N)$	0	0	0	0	$+F_p$

The opposing polarity of  $+F_p$  is  $-F_p$ , and not zero as asserted by Examiner Piziali. TABLE 1 and FIG. 3 of *Shimura* clearly point out the failure of *Shimura* to disclose a polarity  $+F_p$  of function  $f(1)$  being different than the polarities of the other functions when  $t=1$  (i.e., the other functions having a  $-F_p$  polarity), a polarity  $+F_p$  of function  $f(2)$  being different than the polarities of the other functions when  $t=2$ , a polarity  $+F_p$  of function  $f(3)$  being different than the polarities of the other functions when  $t=3$ , a polarity  $+F_p$  of function  $f(i)$  being different than the polarities of the other functions when  $t=i$ , and a polarity  $+F_p$  of function  $f(N)$  being different than the polarities of the other functions when  $t=N$ .

Furthermore, each function is associated with a voltage  $U(i,j)$ . FIG. 4 of *Shimura* illustrates the objective of one function being  $+F_p$  while the other functions are 0 for each time  $t$  is to ensure that, for each time  $t$ , only one voltage  $U(i,j)$  equals a high voltage  $S1$  while the other voltages  $U(i,j)$  are between low voltages  $S2$  and  $S3$ . The Applicant therefore respectfully asserts that *Shimura* teaches away from one voltage  $U(i,j)$  equaling a high voltage  $S1$  while the remaining voltage  $U(i,j)$  equal  $-S1$  for each time  $t$ . As such, *Shimura* also teaches away from one function being  $+F_p$  while the other functions are  $-F_p$  for each time  $t$ .

To more particularly point out and distinctly claim the present invention over *Shimura*, the Applicant has amended independent claim 1 to recite "wherein the mutually orthogonal signals are obtained from at least two types of orthogonal functions having four elementary units of time, within which four elementary units of time one pulse each time has a first nonzero polarity which opposes a second nonzero polarity of the other pulses", and amended claim 9 to recite "wherein, for each elementary unit of time, one pulse has a first nonzero polarity that opposes a second nonzero polarity of the other pulses."

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Withdrawal of the rejection of independent claims 1 and 9 under 35 U.S.C. §102(b) as being anticipated by *Shimura* is therefore respectfully requested.

Claims 2-7 depend from independent claim 1. Therefore, dependent claims 2-7 include all of the elements and limitations of independent claim 1. It is therefore respectfully submitted by the Applicant that dependent claims 2-7 are allowable over *Shimura* for at least the same reason as set forth with respect to independent claim 1 being allowable over *Shimura*. Withdrawal of the rejection of dependent claims 2-7 under 35 U.S.C. §102(b) as being anticipated by *Shimura* is therefore respectfully requested.

Claims 10-15 depend from independent claim 9. Therefore, dependent claims 10-15 include all of the elements and limitations of independent claim 9. It is therefore respectfully submitted by the Applicant that dependent claims 10-15 are allowable over *Shimura* for at least the same reason as set forth with respect to independent claim 9 being allowable over *Shimura*. Withdrawal of the rejection of dependent claims 10-15 under 35 U.S.C. §102(b) as being anticipated by *Shimura* is therefore respectfully requested.

New claim 17 depends from independent claim 1. Therefore, dependent claim 17 includes all of the elements and limitations of independent claim 1. It is therefore respectfully submitted by the Applicant that dependent claim 17 is allowable over *Shimura* for at least the same reason as set forth with respect to independent claim 1 being allowable over *Shimura*. An allowance of claim 17 over the art of record is therefore respectfully requested.

New claim 18 depends from independent claim 9. Therefore, dependent claim 18 includes all of the elements and limitations of independent claim 9. It is therefore respectfully submitted by the Applicant that dependent claim 18 is allowable over *Shimura* for at least the same reason as set forth with respect to independent claim 9 being allowable over *Shimura*. An allowance of claim 18 over the art of record is therefore respectfully requested.

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B. Claims 8 and 16 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,677,705 to *Shimura et al* in view of U.S. Patent No. 6,252,573 B1 to *Ito et al*.

Claim 8 depends from independent claim 1. Therefore, dependent claim 8 includes all of the elements and limitations of independent claim 1. It is therefore respectfully submitted by the Applicant that dependent claim 8 is allowable over *Shimura* in view of *Ito* for at least the same reason as set forth with respect to independent claim 1 being allowable over *Shimura*. Withdrawal of the rejection of dependent claim 8 under 35 U.S.C. §103(a) as being unpatentable over *Shimura* in view of *Ito* is therefore respectfully requested.

Claim 16 depends from independent claim 9. Therefore, dependent claim 16 includes all of the elements and limitations of independent claim 9. It is therefore respectfully submitted by the Applicant that dependent claim 16 is allowable over *Shimura* in view of *Ito* for at least the same reason as set forth with respect to independent claim 9 being allowable over *Shimura*. Withdrawal of the rejection of dependent claim 16 under 35 U.S.C. §103(a) as being unpatentable over *Shimura* in view of *Ito* is therefore respectfully requested.

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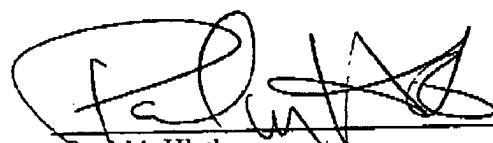
**SUMMARY**

Examiner Piziali's 35 U.S.C. §§102(b) and 103(a) rejections of claims 1-16 have been obviated by the remarks herein supporting an allowance of claims 1-16 over *Shimura*. The Applicant respectfully submits that claims 1-16 herein fully satisfy the requirements of 35 U.S.C. §§ 102, 103 and 112. The allowability of new claims 17 and 18 has been argued above. In view of the foregoing, favorable consideration and early passage to issue of the present application is respectfully requested. If any points remain in issue that may best be resolved through a personal or telephonic interview, Examiner Piziali is respectfully requested to contact the undersigned at the telephone number listed below.

Dated: August 22, 2003Respectfully submitted,  
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